



(19)

(11) Publication number: **03214**

Generated Document.

PATENT ABSTRACTS OF JAPAN(21) Application number: **02010385**(51) Intl. Cl.: **G06F 7/52 G06F 11/22**(22) Application date: **18.01.90**

<p>(30) Priority:</p> <p>(43) Date of application publication: 19.09.91</p> <p>(84) Designated contracting states:</p>	<p>(71) Applicant: MATSUSHITA ELECTRIC INC. LTD</p> <p>(72) Inventor: SAKIYAMA SHIRO</p> <p>(74) Representative:</p>
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(54) MULTIPLIER**(57) Abstract:**

PURPOSE: To obtain $(8 \times n)$ types of sets of input vectors for detection of the faults of a Wallace tree conversion part consisting of the 1st - n-th conversion parts by using a test mechanism which applies an optional input pattern at every full adder or half adder of each conversion part in accordance with the types of input vectors.

CONSTITUTION: In a test mode, the input vectors A and B are secured to equalize the inputs of all full adders of an m-th conversion part ($1 \leq m \leq n$) with a test mechanism. Then the input patterns are inputted to all full adders of the part 3m with the change of both vectors A and B. These input patterns of all full adders are available in eight ways and therefore eight types of sets of vectors A and B are obtained for the detection of the faults of all full adders of the part 3m. Thus, $(8 \times n)$ types of sets of vectors A and B are obtained for the detection of faults of the Wallace tree conversion part 3 consisting of the 1st

- n-th conversion parts 31-3n.

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